PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PU040008	**FOR FURTHER ACTION** See Form PCT/IPEA/416	
International application No. PCT/EP2005/050571	International filing date *(day/month/year)* 09.02.2005	Priority date *(day/month/year)* 13.02.2004
International Patent Classification (IPC) or national classification and IPC INV. H04B1/04		
Applicant THOMSON LICENSING S.A. et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13.12.2005	19.04.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Sorrentino, A Telephone No. +31 70 340-4107

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2005/050571

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3(a) and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4(a))
   - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

   Description, Pages

   1-10 as originally filed

   Claims, Numbers

   1-15 received on 29.03.2006 with letter of 27.03.2006

   Drawings, Sheets

   1-4 as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☒ the claims, Nos. 16-21
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-15
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: EP-A-0 673 112 (MATSUSHITA ELECTRONICS CORP) 20 September 1995 (1995-09-20)

D2: US 2003/201829 A1 (HAGEMAN MICHAEL L ET AL) 30 October 2003 (2003-10-30)

1 The document D2 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

An apparatus (paragraph 22), comprising modulating means (108)for performing multi-carrier modulations (GMSK, 8PSK) modulations.

The subject-matter of claim1 differs from this known in that following features are present

- Processing means for retrieving a digital value corresponding to type of modulation associated with a transmission signal
- Converting means converting said digital value to an analogue signal
- Amplifying means for amplifying the transmission signal, controlled by the analog signal, decreasing bias current when decreasing the efficiency per bit of the digital modulation and vice-versa.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as reducing power consumption.

The solution to this problem proposed in claim 1 of the present application is

considered as involving an inventive step (Article 33(3) PCT) for the following reasons: D2 is not concerned about problem solved by application but rather with signal distortion when amplifying signal associated with different digital modulation and does not hint in any way to the solution provided for by this application.
D1 instead addresses power consumption problem but amplifier is used for only two types of modulation respectively analog and digital: therefore it is very different from the one disclosed in the application where only digital modulation are used.

2 Same reasoning as in paragraph 1 above hold for corresponding independent claims 5, 11 that satisfy PCT requirements concerning novelty, inventiveness and industrial applicability.

3 Claims 2-4,6-10,12-15 are dependent on claims 1,5,11 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

CLAIMS

1. An apparatus (100), comprising modulating means (20) for performing multi-carrier modulations characterized in that it further comprises:

processing means (10) for retrieving a digital value corresponding to type of modulation associated with a transmission signal

converting means (60) converting said digital value to an analog signal,

amplifying means (50) for amplifying the transmission signal, controlled by the analog signal decreasing bias current when decreasing the efficiency per bit of the digital modulation and vice versa.

2. The apparatus (100) of claim 1, further comprising signal transmitting means (70) for wirelessly transmitting said transmission signal.

3. The apparatus (100) of claim 1, wherein said type of modulation includes one of:

bi-phase shift keyed (BPSK) modulation;

quadrature phase shift keyed (QPSK) modulation; and

quadrature amplitude modulation (QAM).

4. The apparatus (100) of claim 1, wherein said transmitter apparatus (100) is part of a mobile transceiver having a battery power supply.

5. A method (400) for controlling a transmitter apparatus (100), comprising:

identifying and retrieving a digital value corresponding to a type of digital modulation for a transmission signal (410, 420);

converting said digital value to an analog signal(430); and

controlling power amplification of said transmission signal using said analog signal in decreasing a bias current of the amplifier when decreasing the efficiency per bit of the digital modulation and vice versa (440)

6. The method (400) of claim 5 further comprised of wirelessly transmitting said transmission signal (450).

7. The method (400) of claim 5, characterized in that said digital value is based on the crest factor.

8. The method according to claim 5 characterized in that bias current is decreased when digital modulation is changed from 64 QAM ¾ to BPSK ½.

9. The method according to claim 7 characterized in that it is in compliance with one of the standards belonging to the set comprising:

- Hiperlan type 2;
- IEEE 802.11a;
- DVB-T
- 802.16a

10. The method (400) of claim 5, wherein said type of digital modulation includes one of:

bi-phase shift keyed (BPSK) modulation;

quadrature phase shift keyed (QPSK) modulation; and

quadrature amplitude modulation (QAM).

11. An apparatus (100), comprising:

a processor(10) for retrieving a digital value corresponding to type of modulation associated with a transmission signal

a digital analog converter (60) converting said digital value to an analog signal

a power amplifier (50) for amplifying the transmission signal, controlled by the analog signal decreasing bias current when decreasing the efficiency per bit of the digital modulation and vice versa.

12. The apparatus (100) of claim 11, further comprising a signal transmitting element (70) operative to wirelessly transmit said transmission signal.

13. The apparatus (100) of claim 11, wherein said type of digital modulation includes one of:

bi-phase shift keyed (BPSK) modulation;

quadrature phase shift keyed (QPSK) modulation; and

quadrature amplitude modulation (QAM).

14. The apparatus (100) of claim 11, further comprising a modulator (20) operative to perform a plurality of different types of digital modulation.

15. The apparatus (100) of claim 11, wherein said apparatus (100) is embodied as a mobile transceiver having a battery power supply.